 **RNS INSTITUTE OF TECHNOLOGY**

**(AICTE Approved,VTU Affiliated & NAAC Accredited with ‘A’ Grade)**

Dr. Vishnuvardhan Road, Channasandra, Rajarajeshwari Nagar Post, Bengaluru - 560 098

Estd: 2001

*An Institute with a difference*

***DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS***

***LESSON PLAN***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***SUBJECT TITLE*** | | **PYTHON APPLICATION PROGRAMMING** | | | |
| ***SUBJECT TYPE*** | | **OPEN –ELECTIVE** | | | |
| ***SUBJECT CODE*** | | **15CS664** | | | |
| ***ACADEMIC YEAR*** | | **2020 (EVEN SEMESTER)** | | **BATCH** | **2017-2020** |
| ***SCHEME*** | | **CBCS scheme (Effective from the academic year 2015 -2016)** | | | |
| ***SEMESTER & SECTION*** | | **VI ‘A’ , ‘D’** | | | |
| ***IA MARKS*** | | **20** | ***EXAM MARKS*** | | **80** |
| ***NUMBER OF LECTURE HOURs/WEEK*** | | **4** | ***TOTAL NUMBER OF LECTURE HOURS*** | | **40** |
| ***FACULTY NAME*** | | **RAJATHA S** | ***NO. OF TIMES HANDLED*** | | **1** |
| ***COURSE LEARNING OBJECTIVES*:** This course will enable students to | | | | | |
| 1. Learn Syntax & Semantics and create Functions in Python | | | | | |
| 1. Handle Strings and Files in Python | | | | | |
| 1. Understand Lists, Dictionaries and Regular Expressions in Python | | | | | |
| 1. Implement Object Oriented Programming in Python | | | | | |
| 1. Build Web Services and introduction to Network and Database Programming in Python | | | | | |
|  | | | | | |
| **COURSE OUTCOMES:** At the end of this course, students are able to: | | | | | |
| CO1 | Examine Python syntax and semantics and be fluent in the use of Python | | | | |
| CO2 | Examine Python syntax and semantics and be fluent in the use of Python flow control and functions | | | | |
| CO3 | Demonstrate proficiency in handling Strings and File Systems. | | | | |
| CO4 | Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions. | | | | |
| CO5 | Interpret the concepts of Object-Oriented Programming as used in Python. | | | | |
| CO6 | Implement exemplary applications related to Network Programming, Web Services and Databases in Python. | | | | |

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| **COURSE**  **OUTCOMES** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 2 | 1 | 1 | 2 | 1 |  |  |  |  |  |  | 1 | 1 | 1 | 1 |  |
| **CO2** | 1 | 2 | 2 | 2 | 1 |  |  |  |  |  |  | 1 | 1 | 1 | 2 |  |
| **CO3** | 1 | 1 | 1 | 1 | 1 |  |  |  |  |  |  | 1 | 1 | 1 | 2 |  |
| **CO4** | 1 | 2 | 1 | 2 | 1 |  |  |  |  |  |  | 1 | 1 | 2 | 1 |  |
| **CO5** | 1 | 1 | 1 | 2 | 1 |  |  |  |  |  |  | 1 | 1 | 2 | 1 |  |
| **CO6** | 1 | 2 | 2 | 2 | 1 |  |  |  |  |  |  | 1 | 1 | 1 | 1 |  |

**CO-PO M ATRIX**

**DELIVERY PLAN WITH DETAILS**

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| **MODULE – 1** | | | | | | | | | | |
| **Lecture**  **#** | | **Topic** | **Mode of Delivery**  (Pls Tick **√**) | | | | | | **Date of Delivery** | **COs**  **Covered** |
| 1 | | 2 | | 3 | 4 |  |  |
|  | | **Module-1: Why should you learn to write programs**  Creativity and Motivations Computer H/w Architecture, Understanding Programming Words and Sentences, Conversing with Python, | **√** | | **√** | |  |  |  | CO1 |
|  | | **Terminology:** interpreter and compiler, Writing a program, What is a program? The building blocks of programs, what could possibly go wrong?, The learning journey | **√** | | **√** | |  |  |  | CO1 |
|  | | **Variables-**Values and types, variables, variable name and keywords, Statements, Operator and operands | **√** | | **√** | |  |  |  | CO1 |
|  | | **Expressions and statements**  Expressions, Order of operations, Modulus Operator, String Operations, Asking the user for input, Comments, Choosing mnemonic variable names, Debugging | **√** | | **√** | |  |  |  | CO1 |
|  | | **Conditional execution**-Boolean Expressions, Logical operators Conditional executions, Alternative execution, Chained conditionals | **√** | | **√** | |  |  |  | CO1 |
|  | | **Conditional execution** -Nested Conditionals, Catching exceptions using try and except, Short-circuit evaluation of logical expressions | **√** | | **√** | |  |  |  | CO1 |
|  | | **Functions-** Function calls, Built-in functions, Type Conversion functions, Random numbers, Math functions, | **√** | | **√** | |  |  |  | CO1 |
|  | | Functions- Adding new functions, Definition and uses, Flow of execution, Parameters and arguments, Fruitful functions and void functions, Why functions? Debugging | **√** | | **√** | | **√** |  |  | CO1 |
| **Textbook : and chapter : T1, Chapter1,Chapter-2, Chapter-3, Chapter-4** | | | | | | | | | | |
| **Signatures** | **Faculty:** | | **#HOURS** | | | | | | **Allotted** | **Taken** |
| **HoD:** | |  |  |
| **Remarks** |  | | | | | | | | | |
| **MODULE – 2** | | | | | | | | | | |
| **Lecture**  **#** | | **Topic** | **Mode of Delivery**  (Pls Tick **√**) | | | | | | **Date of Delivery** | **COs**  **Covered** |
| 1 | | 2 | | 3 | 4 |  |  |
|  | | **Iteration**-Updating variables, The while statement, Infinite Loops, "Infinite Loops" and break | **√** | | **√** | |  |  |  | CO2 |
|  | | **Iteration-**Finishing iterations with continue, Definite loops using for | **√** | | **√** | |  |  |  | CO2 |
|  | | **Loop patterns**---Counting and summing loops, Maximum and minimum loops, Debugging | **√** | | **√** | |  |  |  | CO2 |
|  | | **Strings-**A string is a sequence,Getting the length of a string using len, Traversal through a string with a loop | **√** | | **√** | |  |  |  | CO2 |
|  | | **Strings-**String slices, Strings are immutable, Looping and counting, The in operator | **√** | | **√** | |  |  |  | CO2 |
|  | | **Strings-**String comparison, String methods, Parsing strings, Format operator, Debugging | **√** | | **√** | |  |  |  | CO2 |
|  | | **Files-**Persistence, Opening files, Text files and lines, Reading files, Searching through a file, | **√** | | **√** | |  |  |  | CO2 |
|  | | **Files**-Letting the user choose the filename, Using try, except and open, Writing files, Debugging | **√** | | **√** | |  |  |  | CO2 |
| **Textbook : and Chapter: T1, Chapter-5,Chapter-6, Chapter-7** | | | | | | | | | | |
| **Signatures** | **Faculty:** | | **#HOURS** | | | | | | **Allotted** | **Taken** |
| **HoD:** | |  |  |
| **Remarks** |  | | | | | | | | | |
| **MODULE – 3** | | | | | | | | | | |
| **Lecture**  **#** | | **Topic** | **Mode of Delivery**  (Pls Tick **√**) | | | | | | **Date of Delivery** | **COs**  **Covered** |
| 1 | | 2 | | 3 | 4 |  |  |
|  | | **Lists-**A list is a sequence, Lists are mutable, Traversing a list, List Operations, List slices, List methods, Deleting elements | **√** | | **√** | |  |  |  | CO3 |
|  | | **Lists-**Lists and Functions, Lists and Strings, Parsing lines, Objects and values, Aliasing, List arguments, Debugging | **√** | | **√** | |  |  |  | CO3 |
|  | | **Dictionaries-**As a set of counters**,** Dictionaries and files, | **√** | | **√** | |  |  |  | CO3 |
|  | | **Dictionaries**-Looping and Dictionaries, Advanced text parsing, Debugging | **√** | | **√** | |  |  |  | CO3 |
|  | | **Tuples-** Tuples are immutable, Comparing tuples, Tuple assignment, Dicitionaries and tuples | **√** | | **√** | |  |  |  | CO3 |
|  | | **Tuples-**Multiple assignment with dictionaries, The most common words, Using tuples as keys in dictionaries | **√** | | **√** | |  |  |  | CO3 |
|  | | **Regular Expressions-**Character matching in regular expressions, Extracting data using regular expressions, Combining | **√** | | **√** | |  |  |  | CO3 |
|  | | **Regular Expressions-** searching and extracting, Escape character, Summary, Bonus section for Unix/Linux users, Debugging | **√** | | **√** | |  |  |  | CO3 |
| **Textbook : and Chapter : T1,Chapter-8, Chapter-9, Chapter-10, Chapter-11** | | | | | | | | | | |
| **Signatures** | **Faculty:** | | **#HOURS** | | | | | | **Allotted** | **Taken** |
| **HoD:** | |  |  |
| **Remarks** |  | | | | | | | | | |
| **MODULE – 4** | | | | | | | | | | |
| **Lecture**  **#** | **Topic** | | | **Mode of Delivery**  (Pls Tick **√**) | | | | | **Date of Delivery** | **COs**  **Covered** |
| 1 | | 2 | 3 | 4 |  |  |
|  | **Classes and Objects** - Programmer Defined Types, Attributes, Rectangles | | | **√** | | **√** |  |  |  | CO4 |
|  | **Classes and Objects** - Instances as Return Values, Objects are Mutable, | | | **√** | | **√** |  |  |  | CO4 |
|  | **Classes and Objects-**Copying, Debugging | | | **√** | | **√** |  |  |  | CO4 |
|  | **Classes and Functions -** Time, Pure Functions, Modifiers, | | | **√** | | **√** |  |  |  | CO4 |
|  | **Classes and Functions-**Prototyping and Planning, Debugging | | | **√** | | **√** |  |  |  | CO4 |
|  | **Classes and Methods-**Object-Oriented Features, Printing Objects, | | | **√** | | **√** |  |  |  | CO4 |
|  | **Classes and Methods-**Another Example, A more complicated Example, The init Method | | | **√** | | **√** |  |  |  | CO4 |
|  | **Classes and Methods**:The\_str\_method, Operator Overloading,Type-based Dispatch, polymorphism, Interface and Implementation, Debugging | | | **√** | | **√** |  |  |  | CO4 |
| **Textbook: and chapter : T1,Chapter-15,Chapter-16,T2: Chapter-17** | | | | | | | | | | |
| **Signatures** | **Faculty:** | | **#HOURS** | | | | | | **Allotted** | **Taken** |
| **HoD:** | |  | | | | | |  |  |
| **Remarks** |  | | | | | | | | | |
| **MODULE – 5** | | | | | | | | | | |
| **Lecture**  **#** | **Topic** | | **Mode of Delivery**  (Pls Tick **√**) | | | | | | **Date of Delivery** | **COs**  **Covered** |
| 1 | | 2 | | 3 | 4 |  |  |
|  | **Networked programs-**HTTP, The world's simplest Web browser, Retriving an image over HTTP, Retriving web pages with urlib, | | **√** | | **√** | |  |  |  | CO5 |
|  | **Networked programs-**Parsing HTML and scaping the web, Parsing HTML using regular expressions, | | **√** | | **√** | |  |  |  | CO5 |
|  | **Networked programs-** Parsing HTML using BeautifulSoup, Reading binary files using urllib | | **√** | | **√** | |  |  |  | CO5 |
|  | **Using Web Services-**eXtensible Markup Language-XML, Parsing XML, Looping through nodessss, JAvascript Object Notation-JSON | | **√** | | **√** | |  |  |  | CO5 |
|  | **Using Web Services-**Parsing JSON, Application Programming Interfaces, Google geocoding web service, Security and API usage | | **√** | | **√** | |  |  |  | CO5 |
|  | **Using databases and SQL**-What is a database? Database concepts, Database Browser for SQLite, Creating a database table, | | **√** | | **√** | |  |  |  | CO5 |
|  | **Using databases and SQL-** Structured Query Language summary, Spidering Twitter using a database, **SQL** Basic data modeling, Programming with multiple tables, Constraints in database tables | | **√** | | **√** | |  |  |  | CO5 |
|  | **Using databases and SQL-** Retrieve and/or insert a record, Storing the friend relationship, Three kinds of keys, Using JOIN to retrieve data, Debugging | | **√** | | **√** | |  |  |  | CO5 |
| **Textbook : and chapter :T1,Chapter-12,Chapter-13, Chapter-15** | | | | | | | | | | |
| **Signatures** | **Faculty:** | | **#HOURS** | | | | | | **Allotted** | **Taken** |
| **HoD:** | |  |  |
| **Remarks** |  | | | | | | | | | |

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| **Text Books:**  1. Charles R. Severance, “Python for Everybody: Exploring Data Using Python 3”, 1st Edition, CreateSpace Independent Publishing Platform, 2016. (http://do1.drchuck.com/pythonlearn/EN\_us/pythonlearn.pdf ) (Chapters 1 – 13, 15) 2. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist”, 2nd Edition, Green Tea Press, 2015. (Chapters 15,16,17) |
| **Reference Book:**  1. Charles Dierbach, "Introduction to Computer Science Using Python", 1st Edition, Wiley India Pvt Ltd. ISBN-13: 978-8126556014 2. Mark Lutz, “Programming Python”, 4th Edition, O’Reilly Media, 2011.ISBN-13:  978-9350232873 3. Wesley J Chun, “Core Python Applications Programming”, 3rd Edition, Pearson Education India, 2015. ISBN-13: 978-9332555365 4. Roberto Tamassia, Michael H Goldwasser, Michael T Goodrich, “Data Structures  and Algorithms in Python”,1stEdition, Wiley India Pvt Ltd, 2016. ISBN-13: 978- 8126562176.  5. Reema Thareja, “Python Programming using problem solving approach”, Oxford university press, 2017 |

***(Note:* Mode of Delivery 1: Black Board 2:PPT 3:Video 4:Demo/Hands-on)**

**INTERNAL/ASSIGNMENT/QUIZ SCHEDULE**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TEST and QUIZ** | | **COs and Portions Covered** | | | **ASSIGNMENT** | |
| **Test# and Quiz#** | **DATE** | **CO** | **Modules** | **Assignment#** | | **DATE** |
| **T1 & Q1** |  |  |  |  | |  |
| **T2 & Q2** |  |  |  |  | |  |
| **T3 & Q3** |  |  |  |  | |  |

**SUMMARY**

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| **Signatures**  **With Date** | **Faculty: Rajatha S** | **Total #HOURS** | **Allotted** | **Taken** |
| **HoD:** |  |  |
| **Remarks** |  | | | |

**ENCLOSURES**

1. **Syllabus**
2. **CO Attainment**
3. **Gap Analysis**
4. **Special lectures/talks arranged if any**

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| **Feedback by PAC** |

**Faculty Course coordinator PAC HOD**